

Feeding a horse with Polysaccharide Storage Myopathy.(PSM)

PSM, (PSSM EPSM) is a condition where abnormal amount of branched chain glycogen is stored within the muscle cells. The underlying cause is unknown but in certain breeds it is thought to be inherited as a genetic defect, notably draft horses and American quarter horses.

In horses the underlying pathology seems to be insulin sensitivity where the circulating glucose in the blood is taken up in large amounts into the muscle cells, the best way of thinking about it the opposite to an insulin resistant diabetic. This is in contrast to the human condition which is often associated with a defect in the muscle enzymes responsible for the glycogen breakdown.

The clinical condition often shows itself as a recurrent tying up even with relatively small amounts of exercise, it may also show as a muscle wasting condition and muscular weakness but this is more common in the larger draft breeds.

Diagnosis is made by a muscle biopsy which shows large amount of glycogen deposits in the muscle fibres, this is a quick and simple procedure that can be done at the horses stable and involves taking a centimetre cubed bit of muscle, which heals up very quickly.

As there is no specific cure, treatment for the condition involves radical changes in the horse's diet and exercise regime. The aim of treatment is to reduce the amount of circulating glucose in the blood stream and to reduce the horse's reliance of glucose as its primary form of energy and to switch the body's metabolism to run on short chain fatty acids. These are produced from the fermentation of fibre in the horses' hind gut and the break down of dietary fat. The aim of the diet is to provide at least 20% of its daily energy requirement as fat and the rest a fibre. No concentrate or grains should be fed as well as fibre sources that are molassed.

This equates to a pint of oil or 500grams for a typical thoroughbred horse this will give 34% of the horses maintenance energy requirement , the remaining should be made up of fibre. For example

- 5kg of hay (this assumes a late cut average quality pasture hay. If first cut or legume then this needs to be reduce by up to 15%)
- Or 2 hours of grazing can be substituted for 1 kg of hay.
- Or 800g of unmolassed alfalfa is equivalent to 1kg of hay.
- 600g before soaking of unmolassed sugarbeet pulp is equivalent to 1kg of hay.

If in heavy work the energy of the diet will need to be increased by 5Mcal/day for a 400kg horse, this can be achieved by:

- 3kg of hay extra if the horse is willing to eat this much.
- 6 hours of grazing if available
- 1.3 kg of rice bran
- Or 2kg of sugarbeet pulp
- This can be combined together and the amount adjusted accordingly.

With all these roughage and oil based diets extra vitamin E, selenium, calcium, phosphorus and magnesium needs to be added to the diet, the best and easiest method of this is to get a ready made balancer and add at the label rate. Also especially in exercising horses they need a lot of sodium potassium and chloride this can be added as a 50:50 mix of table salt and low salt into the diet and a hard working horse will need up to 200grams per day.

The main problem with a high fat diet is that they are not very palatable it is best to add the oil to the diet gradually over a 3 week period if you may find it necessary to add a small amount of molasses to the diet to aid in the palatability but this should be faded out once the horse is accustomed to the new diet.

At present there are no diets on the market that can give the required percentage of energy in the form of oil. However there are a number of low starch diets these may be adequate if more energy is needed but oil will still have to be added which may end up giving the horse too much overall calories.

There are some dry fat products on the market that are considered more palatable like cool calories by Performance Horse Nutrition. Liquid oils which are often used are corn oil, rape and vegetable oil. Also linseed and or flax seed can be added to the oil mix as this is a good provider of omega 3 oils which is anti-inflammatory, and should counter balance the high amount of omega 6 in the other oils.

The above is just a feeding guideline and a place to start, every horse is an individual and the feeding should be tailored to its individual requirements but the important part is the minimum of 20% fat energy and no starch.

Exercise should be gradual in its build up but it is an important part of the treatment as the horse needs to gradually get rid of the accumulated glycogen and should be fairly frequent at least 4 times per week. Start off with walking ex for 10mins then stop and watch if the horse is starting to tie up if no sign is present then can continue gentle ex for a further 10min with a bit of added trot. This can be built up over the 3 weeks until it can cope with moderate amount of work.

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